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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|-------------|----------------------|---------------------------------|------------------------|
| 09/888,762 | 06/25/2001 | Yonina C. Eldar | 0492611-0395(MIT 9170) | 9398 |
| 7590 | 07/03/2007 | | | |
| CHOATE, HALL & STEWART LLP Two International Place Boston, MA 02110 | | | EXAMINER Burd, Kevin Michael | |
| | | | ART UNIT 2611 | PAPER NUMBER |
| | | | MAIL DATE 07/03/2007 | DELIVERY MODE PAPER |

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

| | | |
|------------------------------|---------------------------|------------------|
| Office Action Summary | Application No. | Applicant(s) |
| | 09/888,762 | ELDAR ET AL |
| | Examiner Kevin M. Burd | Art Unit 2611 |

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) Responsive to communication(s) filed on 15 November 2006.
- 2a) This action is FINAL. 2b) This action is non-final.
- 3) Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) Claim(s) 1-6,8-30 and 32-48 is/are pending in the application.
 - 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) Claim(s) _____ is/are allowed.
- 6) Claim(s) 1-6,8-30,32-48 is/are rejected.
- 7) Claim(s) _____ is/are objected to.
- 8) Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) The specification is objected to by the Examiner.
- 10) The drawing(s) filed on _____ is/are: a) accepted or b) objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
 - a) All b) Some * c) None of:
 1. Certified copies of the priority documents have been received.
 2. Certified copies of the priority documents have been received in Application No. _____.
 3. Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) Notice of References Cited (PTO-892)
- 2) Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) Information Disclosure Statement(s) (PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) Notice of Informal Patent Application
- 6) Other: _____

1. This office action, in response to the Request for Continued Examination (RCE) and the amendment filed 11/15/2006, is a non-final office action.

Continued Examination Under 37 CFR 1.114

2. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicant's submission filed on 11/15/2006 has been entered.

Response to Arguments

3. Applicant's arguments with respect to claims 1-6, 8-30 and 32-48 have been considered but are moot in view of the new grounds of rejection.

Claim Objections

4. Claims 12 and 35 are objected to under 37 CFR 1.75(c), as being of improper dependent form for failing to further limit the subject matter of a previous claim. Applicant is required to cancel the claims, or amend the claims to place the claims in proper dependent form, or rewrite the claims in independent form. The amended limitations to claims 1 and 27 are the same as recited in claims 12 and 35.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

5. Claims 1, 2, 12, 14-27, 35 and 37-48 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bottomley et al (US 6,801,565) in view Marchetto et al (US 5,513,215).

Regarding claims 1, 2, 12, 27 and 35, Bottomley discloses a receiver shown in figure 4 comprising a bank or plurality of correlators 414a-414l and a method of using the correlators described in column 6, lines 22-39. The receiver receives a composite signal $r(t)$ from the communication medium (column 6, lines 22-31). Figure 3 shows a plurality of users and their corresponding spreading and scrambling signals. These signals make up the transmitted composite signal. The spreading code is user specific and the scrambling signal is group specific. These signals comprise the set of signature signals. The composite signal transmitted from the transmitter of figure 3 will undergo distortion in the communication medium prior to being received by the receiver of figure 4. The bank of correlators outputs signals to a correlation shaper comprising elements 420a, 420b and 450, which shapes the signal by combining the correlator outputs and compensating for channel distortion (column 6, line 40 to column 7, line 5). The bank of correlators outputs a matrix or vector of correlation values that indicate the level of correlation to each of the desired spreading sequences s_d (column 6, lines 31-39).

Bottomley does not disclose the correlation shaper is chosen so that a covariance matrix of an output vector of the correlation shaper has the property that the second and subsequent rows are permutations of the first row. Marchetto discloses a receiver that correlates received signals (column 19, lines 1-28). The covariance matrix of the output vector is shown in column 18, lines 7-19. Each row of the covariance matrix is a permutation of the other rows of the matrix. It would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the teachings of Marchetto into the receiver of Bottomley. Marchetto allows the channel to be modeled for predetermined conditions or worst case conditions and the processed data is able to compensated for channel characteristics that would create errors in the recovered data (column 19, lines 1-40 and abstract).

Regarding claims 14-25 and 37-48, Bottomley discloses using orthogonal spreading codes to spread the transmitted signals (column 9, lines 56-58). Therefore, orthogonal spreading codes will be used in the correlators of the receiver (figure 4). Least Mean Squares (LMS) techniques are used to remove errors from the decorrelated signals (column 14, lines 10-35).

Regarding claim 26, the output of the correlation shaper is fed to downstream elements that detect and forward or process the received signal.

6. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Bottomley et al (US 6,801,565) in view Marchetto et al (US 5,513,215) further in view of the instant application's disclosed prior art (specifically paragraph 0004).

Regarding claim 3, the combination of Bottomley and Marchetto discloses the apparatus and method described in paragraph 5. The combination does not disclose the correlators are a matched filter receiver. However, the instant application's disclosed prior art discloses, in paragraph 0004, CDMA receivers use matched filter receivers that try to mitigate the effect of multiple signature signal interference and background noise. For this reason, it would have been obvious for one of ordinary skill in the art at the time of the invention to use the matched filter receiver of the instant application's prior art in the bank of correlators of the combination of Bottomley and Marchetto.

7. Claims 4-6, 8-11, 27-30, 32-34 and 36 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bottomley et al (US 6,801,565) in view of Marchetto et al (US 5,513,215) further in view of Huang et al (US 6,067,292).

Regarding claims 4-6, 8-11, 13, 28-30, 32-34 and 36, the combination of Bottomley and Marchetto discloses the apparatus and method described in paragraph 5. The combination does not disclose shaping the correlation by minimizing the mean square error. Huang discloses in column 20, lines 14-17, the output of the processed received signal is processed again to minimize the mean square error of the demodulated CDMA signal. This minimizing of the mean square error takes place in a "correlation shaper". It would have been obvious for one of ordinary skill in the art at the time of the invention to incorporate the teachings of Huang into the apparatus and method of the combination of Bottomley and Marchetto. By minimizing the mean

squared error, performance of the receiver and the interference cancellation system can be improved (column 14, lines 46-54).

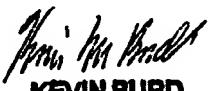
Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin M. Burd whose telephone number is (571) 272-3008. The examiner can normally be reached on Monday - Friday 9 am - 5 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jay Patel can be reached on (571) 272-2988. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

Kevin M. Burd
1/8/2007



KEVIN BURD
PRIMARY EXAMINER